NFIRS 5.0 Self Study Program
Data Conversion Issues: Module 12
NFIRS 4.1 to NFIRS 5.0

Objectives

After reviewing the Data Conversion Issues unit the student will be able to:

1. Describe how the change from NFIRS 4.1 to NFIRS 5.0 and/or the conversion of NFIRS 4.1 data to the NFIRS 5.0 format will affect data analysis.

2. Demonstrate how to answer basic analytical questions about NFIRS 5.0.

Pre-Test #12 - Data Conversion Issues Module

1. An essential objective for the new system is the ability to store and report on information entered in Version 3.0, 4.1, and 5.0 compliant systems

   (a) True
   (b) False

2. All Version 4.1 data elements are collected in Version 5.0

   (a) True
   (b) False

3. A vehicle that burned inside a structure was considered contents or equipment involved in Version 4.1. In Version 5.0, it is considered a vehicle fire if no damage was to the structure.

   (a) True
   (b) False

4. Version 5.0 does not require detector presence data on non-confined fires.

   (a) True
   (b) False

5. Ignition Factor "suspicious" and "incendiary" were converted to "intentional" in Version 5.0.

   (a) True
   (b) False

Getting Information Out of NFIRS

Getting Information Out of NFIRS 5.0

This information is provided to assist in the transition from NFIRS 4.1 to NFIRS 5.0. Users of data that has been converted are cautioned to review and compare both the old data description(s) and the new data description(s) as there are some slight variations and some assumptions had to be made.

NOTE: Conversion Tables for NFIRS 4.1 to 5.0 are found beginning on page 243 of the NFIRS Version 5.0 Design Documentation (January 2000).

Data Conversion Tool

Data Conversion Tool

Many states and local fire departments will continue to report incidents using the 4.1 NFIRS standard. A key objective for the new system is the ability to store and report on information entered in both 4.1 and 5.0 compliant systems. The new NFIRS 5.0 data structure will support the storage and reporting of NFIRS 4.1 compliant data. This data can be validated after entry and before transmission to the next level of the reporting process, using a process similar to that used in the USFA Data Validation Tool. NFIRS 4.1 data will go through the following conversion/validation processing as part of the NFIRS 5.0 system.

- NFIRS 4.1 data will be mapped to the NFIRS 5.0 format
- NFIRS 4.1 data will be marked as 4.1 data
- NFIRS 4.1 converted data will be validated against 4.1 rules

General Guidelines

General Guidelines

All insufficient information “0” have been changed to the appropriate “other” classification. Any reference to classifications in another data element are to the NFIRS 4.1 classification if in the NFIRS 4.1 column and to the NFIRS 5.0 if in the 5.0 column.

NFIRS 4.1 Carryover Elements

NFIRS 4.1 CARRYOVER ELEMENTS

Note that the following data elements will be carried in the NFIRS 5.0 system as part of the converted 4.1 records. These elements are not collected in NFIRS 5.0 and are converted 4.1 records for legacy purposes only:

- Method of Alarm from Public
- Method of Extinguishment
- Construction Type
- Extent of Smoke Damage
- Type of Material Generating Most Smoke
- Form of Material Generating Most Smoke
- Avenue of Smoke Travel

How to Answer Basic Questions

HOW TO ANSWER BASIC QUESTIONS

- General data questions
- How you did it in Version 4.1
- How to do it in Version 5.0
- Any cautions or caveats

How Many Fires?

HOW MANY FIRES?

- Version 4.1: Situation Found 10-19
- Version 5.0: Incident Type 100-199
- Easy documentation of confined fires will probably cause increase in reported fires

How Many Structure Fires?

HOW MANY STRUCTURE FIRES?

- Version 4.1: Situation Found 11
- Version 5.0: Incident Types 110-129
- Includes:
  - Non-confined building fire (111)
  - Structure fires other than buildings (112)
  - Confined fires (113-118)
  - Fires in mobile properties used as a structure (120-123)
- Expected increase due to confined fires
- Some information not collected on confined fires

Structure Fires: 4.1 and 5.0

STRUCTURE FIRES: 4.1 AND 5.0

- Abbreviated confined fires are new in 5.0
- Causes, fire protected data are not collected for confined fires
- Need to specify all structure fires or exclude confined fires
- Fire and Structure Fire Modules are required for:
  - Building fires (111)
  - Structure fires other than buildings (112)
  - Fires in mobile properties used as a structure (120 129)
  - Optional for confined fires

Combined Data Challenges

COMBINED DATA CHALLENGES

- Version 4.1: Situation Found 11 will usually convert to Incident Type 110 (conversion code only)
- This will include Version 4.1 confined chimney fires, food-on-stove, etc.
- Some exceptions exist for mobile structures
- Combined data will have a larger share of less specific incident types (110's for structures, 130's for vehicles, etc.)

Residential Structure Fires

RESIDENTIAL STRUCTURE FIRES

- Version 4.1: Situation Found 11 and Fixed Property Use 400-499
- Version 5.0: Incident Type 110-129 and Property Use 400-499

Residential Units

RESIDENTIAL UNITS

- Property Use 419: One-and two-family dwelling
- Property Use 429: Apartments
- Number of Units on Fire Module B_1
- Not collected for confined fires
- Version 4.1 had range for apartments

4.1 Code	Converts to in 5.0	Definitions
422	4 units	3-6 units
423	12 units	7-20 units
424	21 units	>20 units

Home Structure Fires

HOME STRUCTURE FIRES

- Version 4.1: Situation Found 11, and Fixed Property Use 410-429
- Version 5.0: Incident Types 110-129, and Property Use 410-429 (Basically just 419 and 429)

Manufactured Housing

MANUFACTURED HOUSING

- Version 4.1: Situation Found 11, Mobile Property Type 17 and Fixed Property Use 410-419
- Will convert to Incident Type 121 in Version 5.0
- Version 5.0: Incident Type 121 (fire in mobile home used as a fixed residence), or
- Incident Type 122: (fire in a motor home or camper or recreational vehicle used as a structure)
- Confined fires will not make distinction
- Code 40 is used for all mixed use residential properties
- Trailer park complex (47) no longer exists

Non-Residential Structure

NON-RESIDENTIAL STRUCTURE FIRES

- Version 4.1: Situation Found 11 and Fixed Property Use not between 400 and 499
- Version 5.0: Incident Type 110-129 and Property Use not between 400 and 499

Vehicle Fires

VEHICLE FIRES

- Version 4.1 Situation Found 13
  - Vehicles that burned inside of structures were considered contents of, or equipment involved in structure fires, even if there was no structural involvement
- Version 5.0 Incident Type 130-139
  - From QRG: “Vehicles in or on buildings and other structures should be coded as vehicle fires unless the structure became involved, and then it would be coded as a structure fire

- All 4.1 Situation Found 13’s convert to Incident Type 130 (other vehicle fire)
- Mobile property types covert almost directly

Outside & Other Incident Types

OUTSIDE & OTHER INCIDENT TYPES

New Incident Types Provide Useful Details

- 141 Forest, woods, or wildland fire
- 142 Brush or brush and grass mixture
- 143 Grass fire
- 140 Other natural vegetation fire
- 151 Outside rubbish, trash or waste
- 152 Garbage dump or sanitary landfill fire
- 153 Construction or demolition and landfill fire
- 154 Dumpster or other outside trash replacement fire
- 155 Outside stationary compactor or compacted fire with no damage to compactor
- 150 Other outside rubbish fire
- 162 Outside equipment fire
- 163 Outside gas or vapor combustion explosion without sustained fire
- 164 Outside mailbox fires including courier boxes
- 160 Special outside fire, other (including other outside property of value)
- 171 Cultivated rain or crop fire
- 172 Cultivated orchard or vineyard fire
- 173 Cultivated trees or nursery stock fire
- 170 Other cultivated or vegetation fire

Structure Fire Causes Areas, Etc.

STRUCTURE FIRE CAUSES AREAS, ETC.

- Are confined fires included?
- Inferences from confined fires
- Where possible, information has been inferred for Area of Origin, Equipment Involved, Item First Ignited
- NFPA will insert inferred codes into data when they get it
- Will enable some to be sorted into cause hierarchy
- Determinations have not been made about “intentional, unintentional, equipment failure,” etc.

113-Confined Cooking Fire

113-CONFINED COOKING FIRE

- Cause: Cooking
- Area of Origin: Kitchen or cooking area (24)
- Item First Ignited: Cooking materials, including edible items (76)

- Equipment Involved in Ignition: Unknown cooking equipment (NFPA will insert a new code 640)

114-Confined Chimney Fire

114-CONFINED CHIMNEY FIRE

- Cause: Heating Area
- Area of Origin: Chimney (57 in Version 4.1, not a code in Version 5.0)
- Item First Ignited: Film, residue, included are paint, resin, and chimney film (95 in Version 5.0)
  - Was captured in rubbish, trash and waste (75 in Version 4.1)
  - Converts to rubbish, trash, and waste (96 in Version 5.0)
- Equipment Involved in Ignition: Chimney in flue of unknown type (NFPA will insert a new code 129)

115 - Confined Incinerator Overload

115 - CONFINED INCINERATOR OVERLOAD

- Cause: Other equipment
- Area of Origin: Incinerator area (64 in both versions)
- Item First Ignited: Rubbish, trash or waste (96 in Version 5.0, 75 in Version 4.1)
- Equipment Involved in Ignition: Incinerator (352 in Version 5.0)

116 - Fuel Burner/Boiler Malfunction

116 - FUEL BURNER/BOILER MALFUNCTION

- Cause: Heating
- Area of Origin: Heating equipment room or area (62)
  - Same for both versions
- Item First Ignited: Unknown-type flammable or combustible liquid (NFPA will inset a new code 69)
- Equipment Involved: Boiler, furnace, or central heating unit of unknown type (NFPA will insert a new version 130)
- Version 4.1: Equipment Involved 11 (central heating unit)

117 - Confined Compactor Fire

117 - CONFINED COMPACTOR FIRE

- Cause: Other equipment
- Area of Origin: Chute or container for trash, rubbish or waste (46 in both versions)

- Item First Ignited: Rubbish, trash or waste (96 in Version 5.0, 75 in Version 4.1)
- Equipment Involved in Ignition: Trash compactor (812 in Version 5.0)

118 - Contained Rubbish Fire

118 - CONTAINED RUBBISH FIRE

- Cause: Unknown
  - Probably will lose some smoking, and possibly playing and open flame
  - If fire was intentionally set, Fire and Structure Modules should be completed
- Area of Origin: Unknown
- Item First Ignited: Rubbish, trash or waste (96 in Version 5.0, 75 in Version 4.1)
- Equipment Involved in Ignition: None (NNN)

Cause Undetermined

CAUSE UNDETERMINED

- Version 5.0: Fire Module E_1:
  - 5. Cause under investigation
  - U. Cause undetermined after investigation
- Standard report “fires under investigation” Final causes needed
- Local Issue: fires that will not be investigated
- If just “under investigation” fire will be included on that report
- “Undetermined after investigation” probably preferred when no investigation will be done
  - Impact on local performance statistics?

Arson

ARSON

- Version 4.1: incendiary and suspicious ignition factors were usually lumped together (10-29)
- Version 5.0: 1-intentional (Fire Module E_1 cause)
  - Complete Fire and Structure Modules for confined fires if you suspect fire was intentional
- Mostly relates to contained rubbish fires
- Version 4.1 incendiary and suspicious convert to intentional in Version 5.0
- Will there be a change in numbers?
- No “suspicious” in Version 5.0

Playing With Fire

PLAYING WITH FIRE

- Version 4.1: Ignition factor 36 or 48 (child playing) converts to 5.0:
  - Cause of Ignition (Fire Module E_1): 2 - unintentional
  - Factors Contributing (Fire Module E_2): 19 - playing with heat source
  - Human Factors (Fire Module E_3): 7 - age was a factor; and less than 10
- Version 5.0: Contributing Factor 19 "playing with heat source" does not specify child
- Version 5.0: Fire Module E_3, human factor 7, and age is less than 10?
- Age may be noted under human factor and/or on Juvenile Firesetter Module (Not carried from one to another)

Juvenile Firesetting

JUVENILE FIRESETTING

- Version 4.1: children playing vs. incendiary/suspicious
- Version 5.0: Fire Module E_3, human factor 7, and age is less than 10
- Look for intentional (1) E_1 cause and get age distribution from E_3 (if separating playing)
- Repeat with M_2 age on Juvenile Firesetter Module and age is blank on Fire Module E_3
  - Avoid double counting

Fires Caused by Smoking

FIRES CAUSED BY SMOKING

- Version 4.1: Form of Heat of Ignition 30-39 (smoking materials)
- Version 5.0: Heat Source (Fire Module D_2) 61-63
  - 61 - cigarette (31 in Version 4.1)
  - 62 - pipe or cigar (33 in Version 4.1)
  - 63 - heat from undermined smoking material (30 in Version 4.1)
  - Code 60 is heat from other open flame or smoking material
- Not captured for confined fires and (relevant for contained rubbish (118) or compactor (117)

Heating

HEATING

- Version 4.1: Equipment Involved 10-19 captured heating equipment
- Version 5.0: Equipment Involved 120-199
  - 100's category includes HVAC
- To include confined chimney and burner fires, add Incident Type 114
  - Or assign inferred codes

Wood Stoves & Fireplaces

WOOD STOVES & FIREPLACES

- Version 4.1 Used:
  - Equipment Involved 13 (fixed heater) and 14 (indoor fireplace) and
  - Form of Heat of Ignition 15 or 26 (solid-fueled equipment)

Wood Stoves & Fireplaces in Version 5.0

WOOD STOVES & FIREPLACES IN VERSION 5.0

Equipment Involved (Fire Module F_1)

- 121 Masonry fireplace
- 122 Factory built fireplace
- 123 Fireplace insert/stove
- 124 stove, heating
- 120 Fireplace, chimney, other (Version 4.1 fireplace "14" converts to this)
  - Version 4.1 "13" converts to 131, furnace, local heating unit, built in

Equipment Power Source (Fire Module F_2)

- 41 Wood, paper
- 42 Coal, charcoal
- 40 Other solid fuel
- Form of Heat of Ignition 15 and 16 in Version 4.1 convert, for this field, to power source 40

Wood Stoves, Fireplaces, Chimneys

WOOD STOVES, FIREPLACES, CHIMNEYS

- Version 4.1 might have chimney as Area of Origin with fireplace or wood stove as equipment
  - Old specs for solid-fueled stoves and fireplaces: Equipment Involved = 13, 14 (fixed

heater, fireplace) and Form of Heat of Ignition = 15, 16 (solid fueled equipment)
- Assigned chimney codes: Equipment Involved 125-127
- May want to include confined chimney fires (Incident Type 114) in discussion
  - Inferred for NFPA: Equipment Involved 129 (Unknown-type chimney)

Cooking

COOKING

- Version 4.1: Equipment Involved 20-29 captured cooking equipment
- Version 5.0: Fire Module Equipment Involved F_1
- Codes 630-649, 654 (654 is grease hood or duct exhaust fan)
  - 600's include kitchen and cooking equipment
- To include confined cooking fires, add Incident Type 113
  - NFPA will assign inferred code 640 to Equipment Involved in Incident Type 113's

Electrical Equipment

ELECTRICAL EQUIPMENT

- Version 4.1: Equipment Involved 40-49 or Form of Heat of Ignition 28 (ballast) or 54 (lamp or bulb) captured electrical equipment,
- Version 5.0: Fire Module Equipment Involved F_1 electrical distribution, lighting and power 200-227, 230-299 or E_2 factor contributing to ignition 37 (florescent light ballast)
  - Equipment involved 228 (rectifier or charger) and 229 (battery) are assigned to other equipment
- Confined fires aren't a factor here

Christmas Trees

CHRISTMAS TREES

- Version 4.1: Form of Material First Ignited 41
- Version 5.0 Fire Module D_3 Item First Ignited 41

Fireworks

FIREWORKS

- Version 4.1: Form of Heat of Ignition 63 (fireworks) and 64 (party poppers)

- Version 5.0: Both convert to Fire Module D_2 Heat Source 54 (fireworks, including sparklers, paper caps, party poppers, and fire crackers
- Version 5.0: Incident Type 243 (fireworks explosion with no fire)
    - Civilian Casualty reports would not be required

Smoke Alarms

SMOKE ALARMS

- Version 4.1: Detector Status field was completed for all structure fires
- Version 4.1 codes 1-3 and 5 convert to Fire Module L_1 Detector Present
    - Codes 4 and 8 convert to none present
- Version 4.1 to 5.0 L_4 Operation
    - Codes 1 and 2 convert to 2 “Operated” in Version 5.0
    - Code 3 converts to 3 “Failed to operate”
    - Code 5 converts to 1 “Fire too small to activate”

Detectors & Confined Fires

DETECTORS & CONFINED FIRES

- Version 5.0: Basic Module confined fire data asks only whether detector alerted occupants or not
    - Doesn’t indicate whether detector was present or sounded if it did not alert occupants
- Conversion will provide data for Version 4.1’s confined fires equivalent
    - Will not be present for data collected in Version 5.0
- Full data on non-confined fires
    - Structure Fire Module
        - L_1 Presence of Detectors
        - L_2 Detector Type
        - L_3 Power Source
        - L_4 Detector Operation
        - L_5 Detector Effectiveness
        - L_6 Detector Failure Reason

Smoke Alarm Performance

SMOKE ALARM PERFORMANCE

- Structure Fire Module L_4 Detector Operation
    - 1 Fire too small to activate
    - Operated
    - Failed

- Detector failure reason
- Public usually wants general information only
  - How often were detectors present, not present?
  - How often did they work?
  - Limit to three failure reasons
- Other information helpful for code and program developers

Who Needs Smoke Alarms?

WHO NEEDS SMOKE ALARMS?

- Provides information about how to determine which area could benefit most from a smoke alarm give away program.
- Home (possibly restricted to one- and two-family dwellings or manufactured housing) fires per 1,000 population (Version 4.1 would use all structure fires, 5.0 would need to adjust for confined fires.)

TIMES (X)

TIMES (X)

- Percent of home fires with no detectors present in area of origin (Version 4.1 code 4 and 8 in detector status; Version 5.0 code N in L_1 detector presence on Structure Fire Module)

Equals (=)

EQUALS (=)

- Rate of home fires with no detectors per 1,000 population
- Version 5.0 will only provide the detector presence data on non-confined fires

Version 5.0 Smoke Alarms

VERSION 5.0 SMOKE ALARMS

- Assume smoke alarm presence likelihood is the same in confined fires as non-confined fires
- Take total structure fires, including confined
- Divide by number of fires with known data
- Multiply the known data by this ratio to obtain projected estimate of smoke alarm presence in all fires

Automatic Extinguishing Systems

AUTOMATIC EXTINGUISHING SYSTEMS

- Version 4.1: AES status
  - One field: Operated, Should have operated, Fire too small, none present
  - Operated, Should have operated, fire too small, convert to Present (1) in M_1
  - Operated converts to Undetermined (U) in M_3 (Effectiveness is unknown)

- Version 5.0
  - M_1 AES presence
  - M_2 Type of system
  - M_3 Operation, includes effectiveness
  - M_4 Number of heads
  - M_5 Failure reason

EMS Responses

EMS RESPONSES

- Version 5.0 Incident Types
  - 321 EMS call, not MVA
  - 322 MVA with injuries
  - 323 Motor vehicle/pedestrian injury
- Related Incident Types
  - 311 Medical Assist
  - 554 Assist invalid
  - 661 EMS call where injured party has already been transported or left scene
- Version 4.1 emergency medical call 32 converts to 320, emergency medical call, other
  - Conversion code only

Lost Time Firefighter Injuries

LOST TIME FIREFIGHTER INJURIES

- Fire Service Casualty G_3 Severity
- Codes indicate whether time was lost
  - Moderate (4), severe (5), and life-threatening (6) all indicate lost time
  - Report only, including exposure (1), first aid only (2), and treated by physician (3) have no lost time
- Conversion from 4.1
  - Minor (1) converts to Severity 3 - treated by physician, no lost time
  - Moderate (2) converts to moderate (4)

- Version 4.1 has no assumption of time lost with moderate injury

Population Data & Census Tracts

POPULATION DATA & CENSUS TRACTS

- Population protected, density, and square miles are not collected in the fire department identification record in 5.0
- Census tracts
  - Census tracts or block numbering areas (more rural) can be found at the census tract street locator http://tier$_2$.census.gov/ctsl/ctsl.htm (No "www" in address)
- Web site also gives demographic data on that census tract

Pre-Incident Value of Property

PRE-INCIDENT VALUE OF PROPERTY

- Basic Module lets you collect pre-incident value
- Be careful with claims of "property saved"
  - Most fires don't realistically threaten the entire property

Property Use of Occupancy

PROPERTY USE OF OCCUPANCY

- Property Use is found at Basic Module J
  - Mixed use property codes are on Basic Module
- On-site materials are found on Fire Module C
  - Can query for whether materials were:
    - Bulk storage or warehousing
    - Processing or manufacturing
    - Packaged goods for sale
    - Repair or service
- Building status (Structure Fire Module I$_2$)
- Under construction, Occupied and operating, Idle, Under major renovation, Vacant and secured or not, or Being demolished

Flammable Liquid Storage Fires

FLAMMABLE LIQUID STORAGE FIRES

- Version 4.1 Fixed Property Use 841 (flammable or combustible liquid storage)
- Version 5.0 Basic Module J Property Use 849 (outside storage tank)
- On site Fire Module C, either:

  - 511 Gasoline or diesel fuel
  - 512 Flammable liquid other than gasoline
  - 513 Combustible heating oil, including heating oil
  - 510 Flammable or combustible liquids, other

- Version 4.1 will convert to Property Use 849 with on site material 510

4.1 Ignition Factor: Impaired

4.1 IGNITION FACTOR: IMPAIRED

- 37 - Unconscious; mental or physical impairment; drug or alcohol stupor
- Converts to Fire Form E_3 Human Factor 2 Possibly impaired by alcohol or drugs

Points to Remember

POINTS TO REMEMBER

- Specific Incident Types
- Structure fires:
  - All or non-confined
  - Mobile Property Used as a Structure is in the 120's
  - Many data elements not collected on confined fires. Can infer some
- Watch Conversion Issues
  - Converted codes may involve important assumptions and so not mean exactly what new code means

Data Conversion Issues Module Test

1. Conversion Tables for NFIRS 4.1 to 5.0 are found

   (a) NFIRS Version 5.0 Design Documentation
   (b) Quick Reference Guide (QRG)
   (c) NFIRS Handbook
   (d) America Burning Publication

2. Which is not a part of the conversion/validation process as part of the NFIRS 5.0 system?

   (a) NFIRS 4.1 data will be mapped to the NFIRS 5.0 format
   (b) NFIRS 4.1 data will be marked as 4.1 data
   (c) NFIRS 4.1 converted data will be validated against 5.0 rules
   (d) NFIRS 4.1 converted data will be validated against 4.1 rules

3. Why are reported fires expected to increase in NFIRS 5.0?

   (a) Easy documentation of confined fires
   (b) More fires to report than in previous years
   (c) Definition of a reportable fire has changed
   (d) Reported fires are not expected to increase

4. The following population data is not collected in NFIRS 5.0:

   (a) Population Protected
   (b) Density
   (c) Square Miles
   (d) Census Tract

5. Which are points to remember when working converted Version 4.1 data to Version 5.0 data?

   (a) Incident Numbers
   (b) Specific Incident Types
   (c) Structure Fires: All or non-confined
   (d) Data elements not collected on confined fires